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MICROWAVE ASSISTED SYNTHESIS AND ENZYMATIC INHIBITION ASSAY ON *CITRULLUS LANATUS* UREASE OF ACRYLIC ACID DERIVATIVES

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Ureases are considered the most efficient enzymes currently known, being the first structure crystallized enzyme, in 1926, by biochemist James Batcheller Sumner. These metalloproteins main characteristic is the presence of two Ni^{2+} ions in its active site, which has the function of facilitating the nucleophilic attack of water molecules during a catalysis stage, where in the first stage of the occurrence the release of an ammonia molecule occurred. (NH_3) is a carbamate that in its second stage is spontaneously converted into carbon dioxide (CO_2) and releasing a second molecule of ammonia (NH_3) leading to alkalinization of the pH of the medium[1]. These enzymes are not produced by humans, however, they are abundant in bacteria, plants and vegetables[2]. In agriculture, bacterial urease is responsible for the volatilization of ammonium and the loss of nutrients for plants and the human body. Many bacteria such as Helicobacter pylori use this enzyme for survival, which can be considered a virulence factor and the alkalinization of the environment by the enzyme. cause pathogenic diseases in humans such as ulcers and other gastrointestinal problems[3]. And as many inhibitors prove to be inefficient or toxic, the search for new commercially developed inhibitors becomes increasingly important. In this way, the compounds were synthesized by microwaves, which became a very effective tool for chemical compound vitamins and organic compounds[4]. In this way, acrylic acid compounds were prepared by Knoevenagel-Doebner[5] condensation and comparing the two methods: a) a reflux heating system) use of a microwave reactor[6]. The enzyme model used for inhibitory tests was urease from watermelon seeds (Citrullus lanatus), the urease was purified by transferring the crude extract with cold acetone and ammonium sulfate (NH_4SO_4). The results obtained were promising, as it was possible to purify the enzyme using this methodology and with the use of microwaves, a library of compounds was created through a faster and more effective synthesis than the conventional method, with yields obtained between 75- 95%. Initial tests showed promise as the compounds were able to inhibit the enzyme for the entire period of time tested, exceeding 24 hours. Currently, computational studies are being carried out via molecular docking, with the possibility of using this model for studies of other isoforms of this enzyme.

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